CLEAN AMENDED PARAGRAPHS/SECTIONS/CLAIMS

In the Claims:

Replace the following like numbered claims:

1. (Amended) A method of producing an animation of a group including a plurality of members, said method comprising:

a continuous processing step for determining the states of the respective members at each time step in accordance with predetermined dynamic characteristics of the respective members; and

B1 Cont a discrete processing step for accepting, from the outside, a command specifying the overall state to be achieved for said group and assigning roles to the respective members of the group in accordance with the overall state specified by said command;

wherein if new roles are assigned to members in said discrete processing step, the dynamic states of the respective members are adjusted, in said continuous processing step, in accordance with the assigned new roles;

wherein said discrete processing step includes a role replacement step for selecting one or more of the members and for replacing the roles currently assigned to the respective selected members while not replacing the roles currently assigned to the respective non-selected members.

2. (Amended) A method of producing an animation of a group including a plurality of members, according to claim 1, wherein said role replacement step is performed when a predetermined triggering condition is satisfied or when it is determined that the overall performance index of the group can

B1 cont be reduced by the role replacement.

7. (Amended) An apparatus for producing an animation of a group including a plurality of members, said apparatus comprising:

a continuous processing means for determining the states of the respective members at each time step in accordance with predetermined dynamic characteristics of the respective members; and

a discrete processing means for accepting, from the outside, a command specifying the overall state to be achieved for said group and assigning roles to the respective members of the group in accordance with the overall state specified by said command;

B2 cont wherein if new roles are assigned to members in said discrete processing means, the dynamic states of the respective members are adjusted, in said continuous processing means, in accordance with the assigned new roles;

wherein said discrete processing means includes a role replacement means for selecting one or more of the members and for replacing the roles currently assigned to the respective selected members while not replacing the roles currently assigned to the respective non-selected members.

8. (Amended) An entertainment apparatus for simulating a group including a plurality of interchangeable members, said apparatus comprising:

a continuous processing means for determining the states of the respective members at each time step in accordance with predetermined dynamic characteristics of the respective members; and

a discrete processing means for accepting, from the

outside, a command specifying the overall state to be achieved for said group and assigning roles to the respective members of the group in accordance with the overall state specified by said command;

wherein if new roles are assigned to members in said discrete processing means, the dynamic states of the respective members are adjusted, in said continuous processing means, in accordance with the assigned new roles;

wherein said discrete processing means includes a role replacement means for selecting one or more of the members and for replacing the roles currently assigned to the respective selected members while not replacing the roles currently assigned to the respective non-selected members.

B2
Cont

9. (Amended) A method of controlling a system for simulating a group including a plurality of interchangeable members, said method comprising:

a continuous processing step for determining the states of the respective members at each time step in accordance with predetermined dynamic characteristics of the respective members; and

a discrete processing step for accepting, from the outside, a command specifying the overall state to be achieved for said group and assigning roles to the respective members of the group in accordance with the overall state specified by said command;

wherein if new roles are assigned to members in said discrete processing step, the dynamic states of the respective members are adjusted, in said continuous processing step, in accordance with the assigned new roles;

wherein said discrete processing step includes a role replacement step for selecting one or more of the members and

for replacing the roles currently assigned to the respective selected members while not replacing the roles currently assigned to the respective non-selected members.

10. (Amended) A method of, in a simulation of a group including N members where N is an integer equal to or greater than 2, controlling the movement of the members of the group so that the members are moved from locations in a predetermined initial layout in a state space to locations in a target layout, said method comprising the steps of:

a) assigning locations in said target layout to the respective members lying at locations in said initial layout so that the members are moved along the shortest distances to the locations in the target layout;

b) moving the members at the locations in said initial layout in accordance with the assignments made in step a);

B2 cont

c) calculating the value of a predetermined evaluation function associated with the movements, accomplished in said step b), of the respective members to the assigned locations in the target layout;

d) selecting K members, where K is an integer equal to or smaller than N, having the greatest values of the evaluation function; and

e) replacing the assignments of the locations in the target layout within K! combinations of only the selected K members,

wherein after completion of step e), the method returns to step b) so as to perform steps b) to e) repeatedly.

11. (Amended) A recording medium readable by an information processor, recording a program for enabling the information processor to produce an animation of a group

including a plurality of members, wherein said program enables the information processor to execute:

a continuous processing step for determining the states of the respective members at each time step in accordance with predetermined dynamic characteristics of the respective members; and

a discrete processing step for accepting, from the outside, a command specifying the overall state to be achieved for said group and assigning roles to the respective members of the group in accordance with the overall state specified by said command;

wherein if new roles are assigned to members in said discrete processing step, the dynamic states of the respective members are adjusted, in said continuous processing step, in accordance with the assigned new roles;

B2 Cont

wherein said discrete processing step includes a role replacement step for selecting one or more of the members and for replacing the roles currently assigned to the respective selected members while not replacing the roles currently assigned to the respective non-selected members.

12. (Amended) A recording medium readable by an information processor, recording a program for enabling an information processor, in a simulation of a group including N members where N is an integer equal to or greater than 2, to control the movement of the members of the group so that the members are moved from locations in a predetermined initial layout in a state space to locations in a target layout, wherein said program enables the information processor to execute the steps of:

a) assigning locations in said target layout to the respective members lying at locations in said initial layout

so that the members are moved along the shortest distances to the locations in the target layout;

b) moving the members at the locations in said initial layout in accordance with the assignments made in step a);

c) calculating the value of a predetermined evaluation function associated with the movements, accomplished in said step b), of the respective members to the assigned locations in the target layout;

d) selecting K members, where K is an integer equal to or smaller than N, having the greatest values of the evaluation function; and

e) replacing the assignments of the locations in the target layout within K! combinations of only the selected K members,

wherein after completion of step e), the method returns to step b) so as to perform steps b) to e) repeatedly.